

# SHORT PATH EVAPORATION

Short path evaporation (also called molecular distillation and sometimes known as SPE) is a thermal separation technique that provides minimum pressure drop, permitting high vacuum operation down to 0.001 mbar. Short path evaporation is excellent for gently processing heat sensitive, high boiling products.

## Features

- Operating temperature up to 650°F. Low pressure and high heating temperature allow processing of many hard to distill products
- Residence time of a few seconds, important for heat sensitive products
- Suitable for viscous products
- Excellent turn down capability
- Low product holdup, good for hazardous materials
- Low power requirements

## Operation

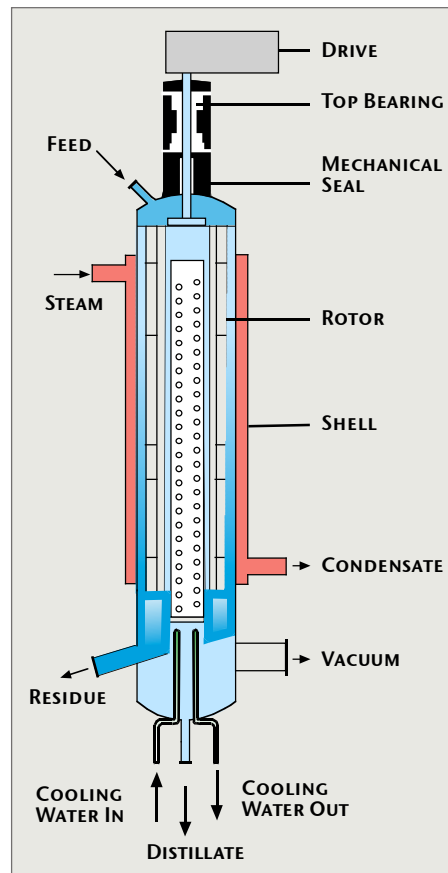
In a short path evaporator, the rotor cage assembly surrounds an internal condenser and revolves at moderate speeds.

Feed enters above the distributor and is spread into a thin film on the inside surface of the shell. The wiper blades gently agitate the film.

The product travels down the heated surface in a very short time while generating vapors. These vapors flow through the rotor and condense on the internally mounted condenser. This short vapor path minimizes pressure drop.

The distilled product and the remaining bottoms are taken out through separate outlets.

The cage type construction in a standard rotor of a short path evaporator allows placement of the internal condenser, extending the operating pressure capability from 1 mbar to 0.001 mbar.



## Sample Applications

Pharmaceuticals like bulk drugs, natural and synthetic vitamins, esters  
Epoxy resins, plasticizers, stabilizers

Fish oil, fatty acids and derivatives, glycerides, tocopherols

Fine chemicals, silicone oils, higher alcohols

Petrochemicals like base oils, lube oils, pitch and tar

Natural extracts

Distilling high boiling volatile components from residues containing catalysts in form of fines

Fractionating of waxes into hard and super hard waxes

Stripping of TDI from Prepolymer  
Distilling of high boiling volatile components from bitumen

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## Evaluation

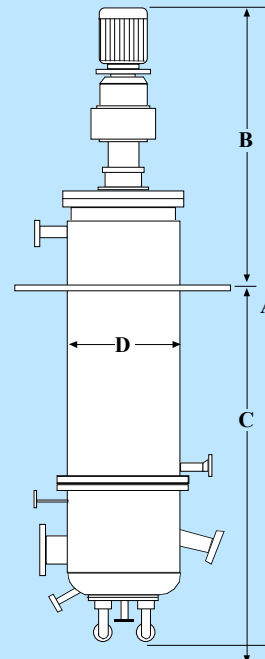
Evaluate your short path evaporator application in our pilot plant at LCI's Test Center in Charlotte, NC.

- Pilot-scale 4.2 ft<sup>2</sup> short path evaporator
- Steam heating system providing 200 psig steam
- Hot oil systems provide heating temperatures up to 650°F
- Vacuum systems provide operating pressures down to <1 mm Hg absolute.
- Reactor vessels/tanks from 60 to 300 gallons
- Lab space for setting up special analytical procedures
- Flexibility to add special equipment and set up tailored systems
- Flexibility to process market development quantities of product
- Explosion-proof electricals (Class 1, Group C, Division I)
- In-depth experience with flammable and other hazardous materials



DIMENSIONAL INFORMATION (Approximate)

Area (m <sup>2</sup> )	A Overall Height (mm)	B Rotor Withdrawal (mm)	C Condenser Withdrawal (mm)	D Diameter (mm)
0.02	960	500	460	114
0.05	1050	600	550	114
0.1	1450	750	950	141
0.2	1555	850	1000	219
0.5	2135	1350	1400	273
1.0	2750	1700	1900	370
1.5	3300	2800	2200	465
2.0	3600	3000	2400	540
3.0	4050	3000	2650	745
3.5	4150	3100	2750	745
5.0	5150	3750	3300	845
7.5	6350	4900	4500	845
10.0	7950	5250	6000	862
12.5	8200	5350	6200	1015
15.0	8550	5850	6400	1095
20.0	9800	7100	7600	1180
25.0	11200	8500	9000	1180



Number of heating jackets varies with size